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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,142	03/26/2004	Ephraim Jeff Gutmark	139141	8853

7590 06/15/2006

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EXAMINER
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KIM, TAE JUN

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

88

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/810,142	GUTMARK ET AL.	
	Examiner	Art Unit	
	Ted Kim	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to for failing to correspond with the specification. The following problems have been identified for Figs. 3 and 4:

For Figures 4, 6, the tubes 70 are not shown with **triangular chevrons** on the fan exhaust nozzle 30. The following paragraphs make it clear that the tubes are to be used on both sides of the chevrons but this is not properly illustrated for the fan nozzle 30. There are no chevrons illustrated for the fan nozzle 30, only for the core nozzle.

“[0029] The above-described noise suppression system includes a manifold and plurality of pairs of hollow injection tubes, i.e. "jets", coupled to the manifold, wherein each pair of tubes discharges air across a plurality of chevrons 44 coupled to either the core engine nozzle or the fan nozzle. More specifically, the above-described noise suppression system includes a manifold and plurality of pairs of hollow tubes that are oriented at a complex angle, i.e. angle 80, wherein each tube has a predetermined opening such that the air discharged across the plurality of chevrons 44, has an injection velocity, a relative velocity and a mass-flow-rate that are variably selected to simulate a mechanical chevron. The injection tubes are positioned azimuthally around either the core engine nozzle or the fan nozzle to facilitate increasing the effectiveness of the chevron mixing effect within the engine shear layer and delaying formation of small scale turbulence.”

### “BRIEF DESCRIPTION OF THE INVENTION

[0005] In one aspect, a method for operating a gas turbine engine is provided. The method includes channeling compressed air from the gas turbine engine to a noise suppression system, and selectively operating the noise suppression system such **that air discharged from the noise suppression system generates a streamwise vortex downstream from each respective chevron.**

[0006] In another aspect, an assembly for a gas turbine engine is provided. The assembly includes a gas turbine nozzle, a plurality of chevrons coupled to the gas turbine nozzle, and a noise suppression system coupled to the gas turbine nozzle, wherein the noise suppression system is selectively operable to facilitate generating **a streamwise vortex downstream from each respective chevron.**

[0007] In a further aspect, a gas turbine engine is provided. The gas turbine engine includes a core engine nozzle, a fan nozzle, a plurality of chevrons coupled to at least one

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the

remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claims 13, 19 are objected to because of the following informalities: "a manifold coupled to said gas turbine nozzle" should be deleted as this has been incorporated into the independent claims. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1- 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Matthews et al (6,314,721), Nesbitt et al (6,718,752) and Hebert (6,826,901) in view of Lilley (2,990,905) and Motsinger (3,527,317). Matthews et al, Nesbitt et al and Hebert all teach a gas turbine nozzle (either the fan or core or both) with a plurality of chevrons but do not teach selectively used noise suppression system to facilitate enhancing a

streamwise vortex generated downstream from each chevron. Lilley teaches a noise reduction system including manifold 2 and tubes 3, 3A which generate vortices/eddies (col. 3, lines 1-19) in a manner similar to teeth or corrugations (note that chevrons are merely triangular teeth or corrugations) and using tube pairs with first and second tubes that are angled inwardly (Fig. 1) at the same angle toward the centerline. The fluid can be compressed air from the engine (col. 2, lines 42+). It would have been obvious to one of ordinary skill in the art to employ tube pairs to angled with an angle  $\beta$  to facilitate generating a streamwise vortices and/or enhance the available noise reduction. Motsinger teaches using a valve to selectively operate the noise reduction system. It would have been obvious to one of ordinary skill in the art to employ a valve to selectively operate the noise reduction system in order to use the noise reduction system only when needed, e.g. in areas where people reside to hear the noise and/or to utilize the engine air for maximum thrust and thus reduce flow and/or thrust losses associated with bleeding the engine air. As for the number of tube pairs being exactly 8, this is deemed an obvious matter of finding the workable ranges in the art. It would have been obvious to one of ordinary skill in the art to employ exactly 8 tube pairs as an obvious matter of finding the workable ranges in the art.

***Potentially Allowable Subject Matter***

6. Claim 10 would be favorably considered if rewritten in independent form including all of the limitations of the base claim and any intervening claims and to further specify that each tube pair is located on respective angled sides of each chevron.

***Response to Arguments***

7. Applicant's replacement drawing submission of 04/12/2006 has been entered and these changes approved. However, the drawings remain objected to for the same reasons expressed above.

8. Applicant's arguments filed 04/12/2006 have been fully considered and amend around some of the rejections but they are not persuasive with respect to the grounds of rejection maintained above.

9. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

10. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation is addressed above.

11. The argument that the applied references “teach away” from the claimed subject matter is not persuasive. A reference will teach away only if it suggests that the line of development flowing from the reference’s disclosure is unlikely to be productive of the results sought by the inventor. In re Gurly, 27 F.3d 551, 553, 31USPQ2d 1130, 1132 (Fed. Cir. 1994). From a review of the disclosures of the applied references, it is clear that these references do not “teach away” from the claimed invention, since none of their disclosures teaches, either expressly or impliedly, that it is undesirable to combine the above references.

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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June 12, 2006	Fax (After Final)	571-273-8300
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Patents Assistance Center	Telephone	800-786-9199



METHODS AND APPARATUS FOR OPERATING GAS TURBINE ENGINES  
 INVENTOR: EPHRAIM J. GUTMARK, et al.  
 DOCKET: 139141  
 ATTY: ROBERT B. REESER, III; PHONE: (314) 621-5070  
 REPLACEMENT SHEET

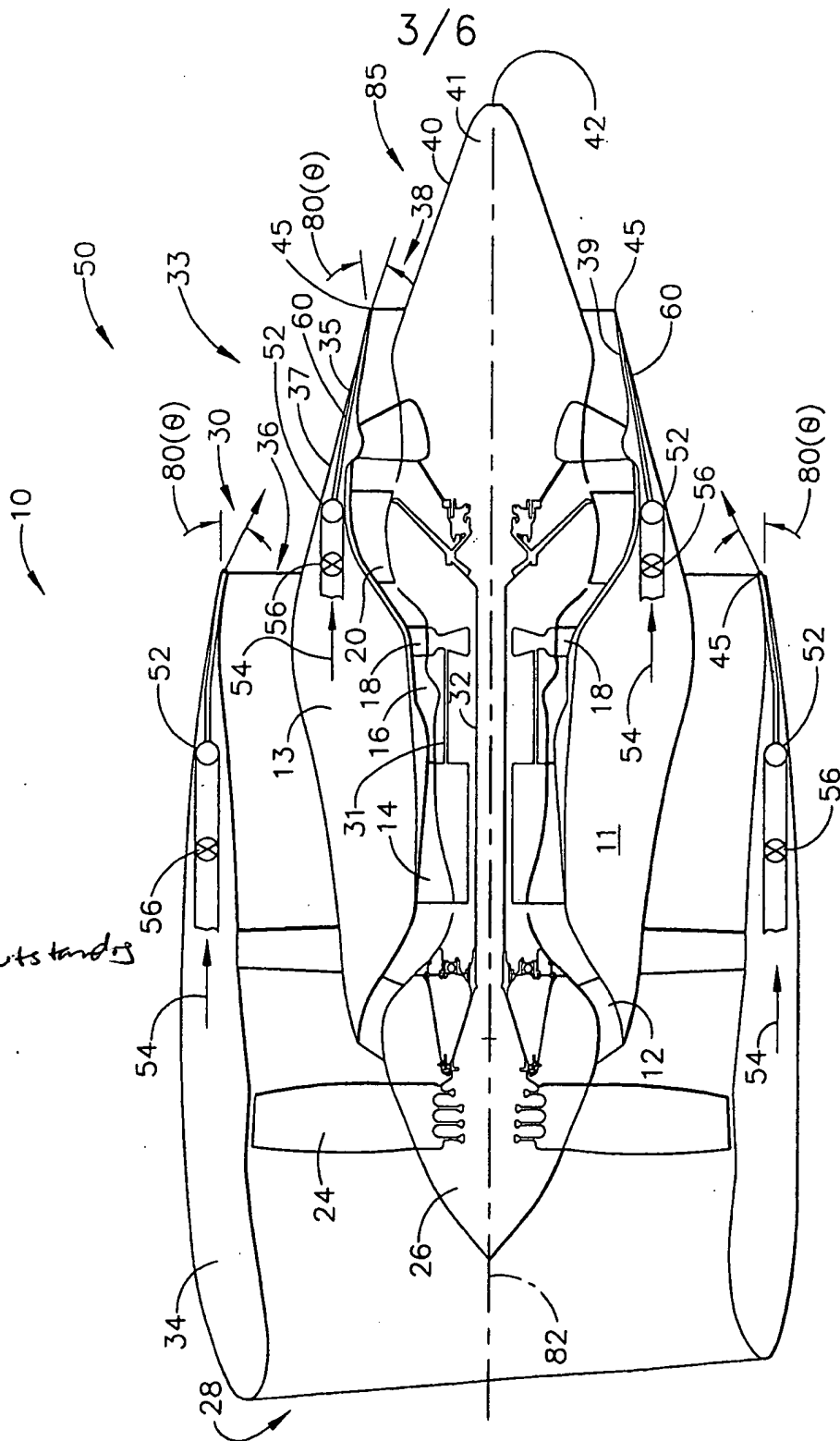


FIG. 3

Entry  
 Approved.

Other  
 objections  
 remain outstanding

TN  
 6/12/06